

PERFLUORINATED CHEMICALS AND SEMEN QUALITY, THE LIFE Study

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Background and Aims: The relation between persistent environmental chemicals and semen quality is still evolving, given that much of the available evidence relies upon couples seeking infertility treatment. We assessed the relation between perfluorinated chemicals (PFCs) and semen quality in the context of lifestyle among male partners participating in a cohort of couples attempting to become pregnant without an infertility history.

Methods: We utilized population-based sampling strategies to recruit 501 couples discontinuing contraception for purposes of becoming pregnant from two geographic regions with reported environmental exposures to persistent pollutants. Upon enrollment into the cohort, couples completed baseline interviews and anthropometric assessments and provided blood for the quantification of 8 serum PFCs (perfluorosulfonates, perfluorocarboxylates and perfluorosulfonamides) using tandem mass spectrometry, 2005-2009. Men collected semen samples at home following two days of abstinence, and returned them by overnight mail to a central andrology laboratory. Linear regression analysis adjusting for age, urinary cotinine, serum lipids, and research site was used to estimate the effect of PFCs (ng/ml as categorized into quartiles) in relation to a spectrum of conventional semen quality measurements along with CASA and flow cytometry measures.

Results: Four PFCs (perfluorodecanoate [PFDeA], perfluorooctane sulfonamide [PFOSA], perfluorooctane sulfonate [PFOS], and perfluorooctanoate [PFOA]) were adversely associated with select semen quality endpoints, with effects seemingly concentrated with sperm head size. Men in the highest quartile of PFOA had significantly smaller sperm head length (-0.08; p=0.03), area (-0.26; p=0.03) and perimeter (-0.15; p=0.04) compared to men in the lowest quartile.

Conclusions: Select PFCs were associated with decrements in sperm head endpoints and may be indicative about possible modes of action, particularly in the absence of other adverse effects on other aspects of semen quality.